ANNUAL REPORT

1962

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

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ON THE

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

OWRC PROJECT 58-W-17

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

OPERATED FOR

THE TOWN OF DUNNVILLE

THE SHERBROOKE METALLURGICAL COMPANY

THE ELECTRIC REDUCTION COMPANY

BY

THE ONTARIO WATER RESOURCES COMMISSION

MR. A.M. SNIDER	CHAIRMAN
DR. A.E. BERRY	GENERAL MANAGER
MR. D.S. CAVERLY	ASSISTANT GENERAL MANAGER AND DIRECTOR, DIVISION OF PLANT OPERATIONS
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PREPARED BY

THE DIVISION OF PLANT OPERATIONS

I N D E X

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

I HISTORY

The Dunnville Regional Water Supply System distributes microstrained chlorinated water to the Town of Dunnville, the Sherbrooke Metallurgical Company, and the Electric Reduction Company, on the east bank of the Grand River at Port Maitland.

By appropriate valving at Dunnville, it is possible for the system to supply water to the Town of Dunnville directly or through the Town of Dunnville Filtration Plant if further treatment of water is necessary.

The supply system was designed by the Canadian British Engineering Consultants, Toronto; contractors for the project are as follows:

General Contractor	-	The Schwenger Construction Company Limited, Hamilton.
Intake and Crib	-	Dravo of Canada Limited, Toronto.
Pipe Lines	-	Mathews Company Limited, London.
Grand River Tunnel Crossing	-	MacNamara Construction Ltd., Toronto.

The plant is designed to deliver approximately twenty-one million gallons per day and the approximate cost of the entire project is $2,500,000.00.

The system was placed in partial operation in August, 1960, utilizing the Dunnville pumps to supply the Port Maitland

area. Complete operation of the system was effective in November of 1960. The Dunnville project was officially opened July 26th, 1961.

II DESCRIPTION OF THE SYSTEM

1. Intake

The intake consists of 1580 feet of 48" diameter asbestos bonded corrugated metal intake pipe commencing at a crib located in 25 feet of water in Lake Erie, and terminating at the low lift pumping station.

2. Low Lift Station

Raw water from the intake passes through removable screens into separate compartments of the low lift station, from which it is pumped by vertical turbine pumps to the microstrainer. Each of the three low lift pumps will deliver approximately 4,750 gallons per minute to the microstrainer.

3. Microstrainer

Six microstrainers, each 10 feet in diameter, and 10 feet long, and equipped with Mark 0 fabric with 165,000 openings per square inch, are located in the high lift station, and are used for the removal of algae before passing into the high lift clear well. During operation, the microstrainers are continuously washed and cleaned.

4. Clear Well

Water from the microstrainers enters a clear well located under the high lift station which has a capacity of 260,000 gallons. At this time, the raw microstrained water is chlorinated, and is ready for distribution throughout the system.

5. Chlorination

Chlorination of clear well water is accomplished by two automatically flow controlled chlorinators which supply the required quantity of chlorine to the water. Chlorine is received in one ton cylinders and stored in a covered area adjacent to the chlorinating room.

6. Dunnville Supply

Three pumps located in the high lift station supply water to the Town of Dunnville. One of these pumps is rated at 1000 gpm. The remaining two pumps work in parallel order, each rated at 1200 gpm. These pumps are automatically controlled by pressure conditions telemetered from the Dunnville Distribution System proper and water is supplied to Dunnville through approximately 23,000 feet of 16 inch pipe line.

7. Port Maitland Supply

Water is supplied to Port Maitland by four single stage high lift pumps. One of these is a vari-speed pump which is capable of delivering 6,000 gpm. The other three are constant speed pumps which when operating in parallel will deliver an additional 12,000 gpm. One of these constant speed pumps is normally used as a standby unit. The pipe line to Port Maitland is approximately 21,000 feet long and is 36 inches in diameter.

8. Facilities

The administration section of the high lift station contains a laboratory, locker rooms, lunch room, and superintendent's office, with necessary washrooms and heating equipment.

III PROJECT MANAGEMENT

After the completion of an OWRC constructed project, the Plant Operations Division of the OWRC assumes responsibility for the operation, maintenance and control of the project. However, the OWRC does wish to work in close cooperation with the local authorities. In order to do so, a Local Advisory Committee is formed consisting of representatives from all parties with an interest in the project. This Committee assists the Plant Operations Division in the administration of the project. The number of meetings held during the year varies with the size and complexity of the project.

For the Dunnville Project, the Town of Dunnville, the Sherbrooke Metallurgical Company and the Electric Reduction Company are represented on the Committee. The Committee met with the OWRC four times during the year. Some of the major items discussed during the year were the operating budget, the possible supply of water to the Townships of Dunn and Sherbrooke, salary changes, the hiring of a new operator, the tapping into the mains and problems involving the intake and micro-strainers.

IV PLANT OPERATION

(A) FLOWS

TOWN OF DUNNVILLE

During the year a total of 352,511,000 gallons of water was supplied to the Town at an average of 966,000 gallons per day. The maximum daily flow supplied during the year was 1,607,000 gallons per day. A more detailed description is given in Tables I and II and Fig. 1.

PORT MAITLAND AREA

During the year a total of 2,862,342,000 gallons of water was supplied to the area at an average of 7,842,000 gallons per day. The maximum daily flow supplied during the year was 12,920,000 gallons. The maximum flow rate recorded was 13,968,000 gallons per day and average daily maximum flow rate was 9,205,000 gallons per day for the year. A more detailed description is given in Tables III and IV and Fig. 1.

COMBINED DUNNVILLE AND PORT MAITLAND

The total amount of water supplied by the plant was 3,214,853,000 gallons during the year at an average of 8,808,000 gallons per day. A more detailed description is given in Tables V and VI and Fig. 1.

TABLE I

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

DUNNVILLE FLOWS

WEEK ENDING	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
Jan. 6	6.209	1.035	1.085	2.448	2.448
13	7.850	1.121	1.182	2.448	2.448
20	7.186	1.026	1.246	2.448	2.448
27	7.923	1.132	1.244	2.448	2.448
31	4.529	1.131	1.284	2.448	2.448
Feb. 3	3.437	1.146	1.206	2.448	2.448
10	8.205	1.172	1.313	2.448	2.448
17	8.470	1.210	1.330	2.448	2.448
24	7.286	1.041	1.242	2.448	2.448
28	3.728	0.932	1.045	2.448	2.448
Mar. 3	2.571	0.857	0.949	2.448	2.448
10	7.102	1.014	1.373	2.448	2.448
* 17	7.795	1.113	1.235	2.448	2.448
* 24	7.500	1.070		2.448	2.448
31	6.278	0.897	1.010	2.448	2.448
Apr. 7	6.149	0.878	1.017	2.448	2.448
14	5.954	0.850	0.948	2.448	2.448
21	5.926	0.846	0.948	2.448	2.448
28	6.195	0.885	0.970	2.448	2.448
30	1.636	0.818	0.917	2.448	2.448
May 5	4.443	0.888	0.976	2.448	2.448
12	6.118	0.874	0.951	2.448	2.448
19	7.347	1.050	1.227	2.448	2.448
26	6.744	0.963	1.138	2.448	2.448
31	5.491	1.098	1.322	2.448	2.448
June 2	2.079	1.039	1.063	2.016	2.016
9	7.993	1.142	1.242	2.448	2.448
16	6.720	0.960	1.109	2.448	2.448
23	6.488	0.927	1.040	2.448	2.448
30	7.012	1.002	1.161	2.448	2.448
July 7	8.832	1.262	1.489	2.448	2.448
14	9.615	1.373	1.548	2.448	2.448
21	8.974	1.282	1.607	2.448	2.448
28	5.206	0.744	0.805	2.448	2.448
31	2.745	0.915	1.053	2.448	2.448
Aug. 4	4.372	1.093	1.142	2.448	2.448
11	6.412	0.916	1.090	2.448	2.448
18	6.208	0.887	1.029	2.448	2.448
25	6.881	0.983	1.088	2.448	2.448
31	6.540	1.090	1.177	2.448	2.448

*Estimated

Table I

Dunnville (Cont'd.)

WEEK ENDING	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
Sept.1	0.968	0.968	0.968	2.448	2.448
8	7.415	1.059	1.125	2.448	2.448
15	6.771	0.967	1.136	2.448	2.448
22	6.395	0.913	1.100	2.448	2.448
29	6.547	0.935	1.063	2.448	2.448
30	0.756	0.756	0.756	2.448	2.448
Oct. 6	5.341	0.890	1.005	2.448	2.448
13	5.535	0.791	0.976	2.448	2.448
20	6.118	0.874	1.009	2.448	2.448
27	6.156	0.880	1.027	2.448	2.448
31	3.425	0.858	0.930	2.448	2.448
Nov. 3	2.455	0.818	0.882	2.448	2.448
10	5.818	0.831	0.978	2.448	2.448
17	5.766	0.824	0.957	2.448	2.448
24	5.716	0.817	0.959	2.448	2.448
30	5.103	0.851	0.908	2.448	2.448
Dec. 1	0.685	0.685	0.685	2.448	2.448
8	5.539	0.791	0.913	2.448	2.448
15	5.938	0.848	0.937	2.448	2.448
22	5.854	0.836	0.930	2.448	2.448
29	4.732	0.676	0.756	2.448	2.448
31	1.329	0.665	0.727	2.448	2.448

TABLE II

DUNNVILLE REGIONAL WATER SUPPLY SYSTEM

DUNNVILLE FLOWS

MONTH	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
JAN.	33.697	1.085	1.284	2.448	2.448
FEB.	31.126	1.112	1.330	2.448	2.448
MARCH	31.246	1.008	1.373	2.448	2.448
APRIL	25.860	.862	1.017	2.448	2.448
MAY	30.143	.972	1.322	2.448	2.448
JUNE	30.292	1.010	1.161	2.448	2.448
JULY	35.372	1.141	1.607	2.448	2.448
AUG.	30.413	0.981	1.177	2.448	2.448
SEPT.	28.852	0.962	1.136	2.448	2.448
OCT.	26.575	0.857	1.027	2.448	2.448
NOV.	24.858	0.829	0.978	2.448	2.448
DEC.	24.077	0.777	0.937	2.448	2.448
YEAR	352.511	0.966	1.607	2.448	2.448

TABLE III

PORT MAITLAND

FLOWS

WEEK ENDING	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
Jan. 6	38.660	6.440	6.790	6.912	6.816
13	43.890	6.270	7.200	8.640	7.365
20	35.472	5.067	6.440	6.912	6.562
27	38.680	5.525	5.630	5.760	5.760
31	21.720	5.430	5.900	5.760	5.760
Feb. 3	15.830	5.276	5.420	5.760	5.712
10	38.250	5.464	5.720	5.760	5.760
17	42.640	6.091	6.260	6.480	6.480
24	40.240	5.748	6.140	6.678	6.382
28	26.710	6.677	7.470	7.920	7.560
Mar. 3	21.310	7.103	7.110	8.352	8.352
10	49.690	7.098	7.590	8.352	8.352
* 17	51.730	7.390	7.510	8.640	
* 24	36.000	5.100			
31	50.020	7.145	7.780	7.920	7.920
Apr. 7	53.550	7.650	8.230	8.640	7.817
14	47.790	6.827	8.140	8.640	7.855
21	43.080	6.154	7.980	8.640	6.440
28	53.050	7.579	9.060	9.504	8.208
30	16.650	8.325	8.680	9.360	9.000
May 5	39.900	7.980	8.630	9.072	8.669
12	56.050	8.007	8.890	9.504	8.928
19	57.680	8.240	8.960	9.360	8.825
26	55.980	7.997	9.220	10.080	8.393
31	42.360	8.472	9.240	10.080	9.763
June 2	18.150	9.075	9.290	9.360	9.216
9	55.160	7.880	9.170	9.792	8.928
16	56.320	8.046	8.830	9.792	9.052
23	56.760	8.109	8.470	8.928	8.231
30	61.220	8.746	9.250	11.232	8.517
July 7	61.030	8.718	10.920	11.520	10.677
14	50.190	7.170	10.940	11.520	10.677
* 21	2.030	0.290	11.450	2.160	
* 28	0.250			1.440	1.440
31	3.290	1.097	2.010	4.320	2.688
Aug. 4	33.760	8.440	9.820	11.088	9.792
11	61.250	8.750	11.180	11.808	10.121
18	30.750	4.393	5.140	6.768	5.246
25	56.810	8.115	9.860	10.512	9.771
31	53.120	8.853	9.790	11.232	10.248

Table III

Port Maitland (Cont'd.)

WEEK ENGING	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
Sept.1	10.900	10.900	10.900	11.379	11.379
8	60.390	8.627	10.970	11.232	10.245
15	65.210	9.316	10.040	10.224	9.607
22	79.310	11.330	12.920	13.968	12.610
29	83.570	11.938	12.880	13.680	13.680
30	10.920	10.920	10.920	13.680	13.680
Oct. 6	63.740	10.623	11.960	13.680	11.829
13	77.310	11.044	12.210	12.520	11.555
20	82.140	11.734	12.680	12.960	12.651
27	80.720	11.531	12.170	12.528	12.302
31	42.240	10.560	11.120	12.528	12.276
Nov. 3	29.930	9.977	10.290	11.520	10.755
* 10	30.140	4.306	9.810	10.080	6.110
17	71.610	10.230	11.910	12.240	10.615
24	86.080	12.297	12.530	12.960	12.857
30	66.680	11.113	12.090	12.960	12.720
Dec. 1	10.490	10.490	10.490	11.520	11.520
8	71.560	10.223	10.980	11.500	11.500
15	64.990	9.284	9.870	10.800	9.840
22	71.420	10.203	11.530	11.952	11.320
29	72.110	10.301	11.400	11.952	11.250
31	13.860	6.930	7.290	9.360	9.360

*Estimated

TABLE IV

PORT MAITLAND

FLOWS

MONTH	TOTAL FLOW	Avg. Daily Flow MGD	Max. Daily Flow MGD	Max.Flow Rate Recorded MGD	Avg.Daily Max Flow Rate MGD
JAN.	178.422	5.756	7.200	8.640	6.529
FEB.	163.670	5.845	7.470	7.920	6.338
MARCH	208.750	6.734	7.780	8.640	8.222
APRIL	214.120	7.137	9.060	9.504	7.709
MAY	251.970	8.128	9.240	10.080	8.877
JUNE	247.610	8.254	9.290	11.232	9.038
JULY	* 116.790	3.767	10.940	11.520	9.267
AUG.	235.690	7.603	11.180	11.232	8.923
SEPT.	310.300	10.344	12.920	13.968	11.602
OCT.	346.150	11.166	12.680	13.680	12.127
NOV.	284.440	9.481	12.530	12.960	10.522
DEC.	304.430	9.820	11.530	11.952	10.898
YEAR	2,862.342	7.842	12.920	13.968	9.205

* Reduced flow - approximately 2 weeks.

TABLE V

COMBINED

PORT MAITLAND AND DUNNVILLE

WEEK ENDING	TOTAL FLOW PT. M. & DUNN. MGD	AVG. DAILY FLOW PT. M. & DUNN. MGD	MAX. DAILY FLOW PT. M. & DUNN. MGD
Jan. 6	44.869	7.490	7.865
13	51.740	7.391	
20	42.658	6.094	7.662
27	46.603	6.657	6.802
31	26.249	6.561	7.184
Feb. 3	19.267	6.422	6.610
10	46.455	6.636	6.852
17	51.110	7.301	7.500
24	47.526	6.789	7.227
28	30.438	7.609	8.466
Mar. 3	23.881	7.960	8.049
10	56.792	8.113	8.953
* 17	59.525	8.503	8.735
* 24	43.500	6.170	
31	56.298	8.042	8.770
Apr. 7	59.699	8.528	9.178
14	53.744	7.677	9.063
21	49.006	7.000	8.885
28	59.245	8.464	10.030
30	18.286	9.143	9.597
May 5	44.343	8.869	9.606
12	62.168	8.881	9.841
19	65.027	9.290	10.057
26	62.724	8.960	10.175
31	47.851	9.570	10.562
June 2	20.229	10.114	10.353
9	63.153	9.022	10.245
16	63.040	9.006	9.939
23	63.248	9.036	9.510
30	68.232	9.748	10.411
July 7	69.862	9.980	12.364
14	59.805	8.543	12.017
* 21	11.004	1.572	2.593
* 28	5.456		
31	6.035	2.017	3.063
Aug. 4	38.132	9.533	10.957
11	67.662	9.666	12.053
18	36.958	5.280	6.111
25	63.691	9.098	10.934
31	59.660	9.943	10.808

Table V

Port Maitland and Dunnville (Cont'd.)

WEEK ENDING	TOTAL FLOW PT. M. & DUNN. MGD	AVG. DAILY FLOW PT. M. & DUNN. MGD	MAX. DAILY FLOW PT. M. & DUNN. MGD
Sept.1	11.868	11.868	11.868
8	67.805	9.686	11.952
15	71.981	10.283	10.981
22	85.705	12.243	13.963
29	90.117	12.873	13.896
30	11.676	11.676	11.676
Oct. 6	69.081	11.513	12.607
13	82.845	11.835	12.969
20	88.258	12.608	13.622
27	86.876	12.411	13.197
31	45.665	11.418	11.995
Nov. 3	32.385	10.795	11.172
10	35.958	5.137	10.491
17	77.376	11.054	12.687
24	91.796	13.114	13.425
30	71.783	11.964	12.740
Dec. 1	11.175	11.175	11.175
8	77.099	11.014	11.773
15	70.928	10.132	10.512
22	77.274	11.039	12.445
29	76.842	10.977	12.116
31	15.189	7.595	8.017

* Estimated

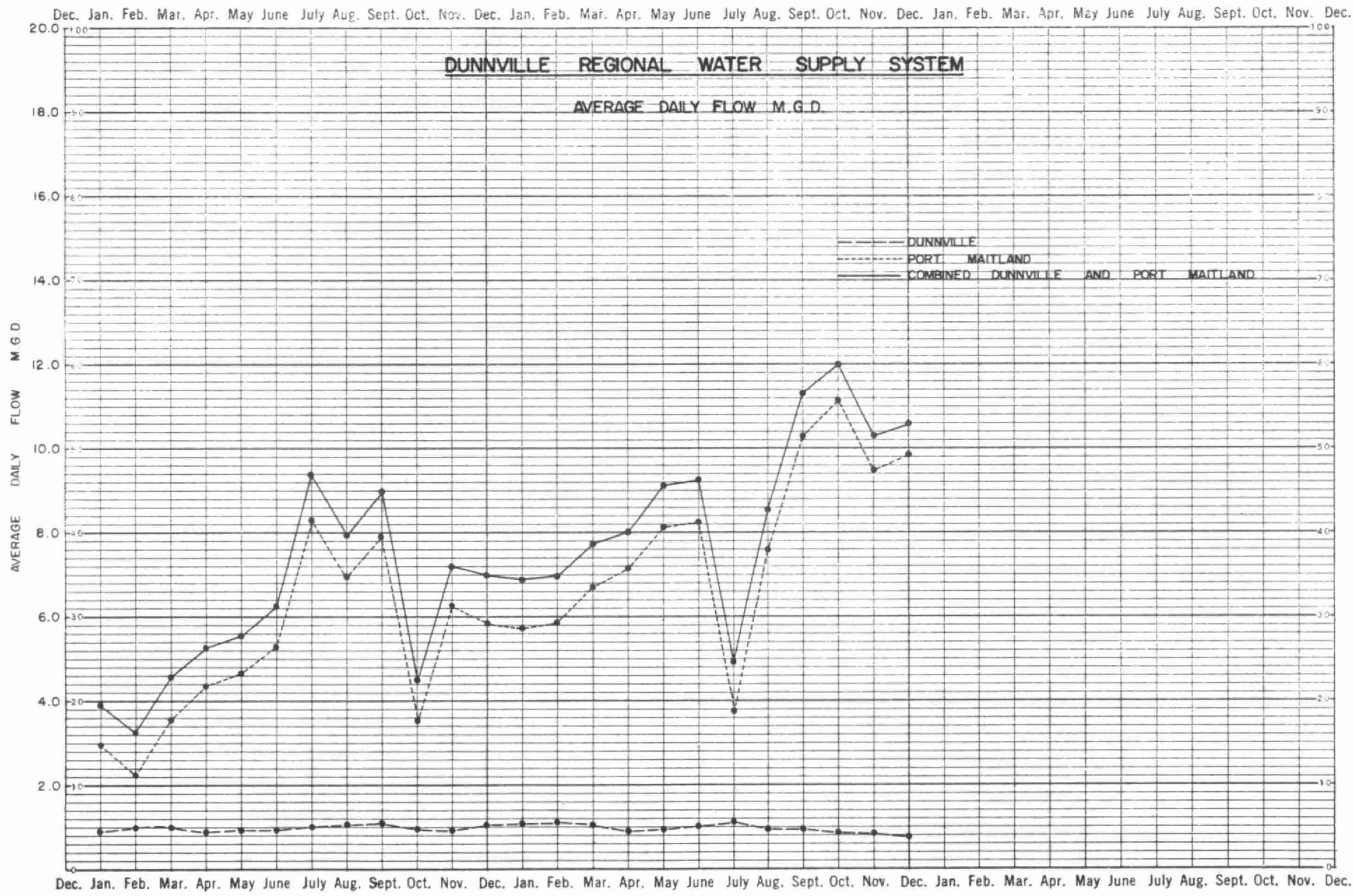
TABLE VI

COMBINED

PORT MAITLAND AND DUNNVILLE

MONTH	TOTAL FLOW PT. M. & DUNN MGD	AVG. DAILY FLOW PT. M. & DUNN. MGD	MAX. DAILY FLOW PT. M. & DUNN. MGD
JAN.	212.119	6.841	8.373
FEB.	194.796	6.957	8.466
MARCH	239.996	7.742	8.953
APRIL	239.980	7.999	10.030
MAY	282.113	9.100	10.562
JUNE	277.902	9.264	10.411
JULY	152.162	4.908	12.364
AUG.	266.103	8.584	12.053
SEPT.	339.152	11.306	13.963
OCT.	372.725	12.023	13.622
NOV.	309.298	10.310	13.425
DEC.	328.507	10.597	12.445
YEAR	3,214.853	8.808	13.963

GC 8-66
Three Years by Months X 100 Divisions
MADE IN CANADA



Year of 1961 Year of 1962 Year of 19

FIG. I

(B) TREATMENT

The Dunnville plant is equipped to microstrain raw Lake Erie Water before distribution. Microstraining is primarily designed to control algae conditions and the equipment has performed this function satisfactorily.

Results of samples sent to the OWRC Laboratory for water and analysis are shown on Table VIII. Results of turbidity tests taken daily at the plant are in Table VII.

TABLE VII

	TURBIDITY					
	RAW WATER			TREATED WATER		
MONTH	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE
Jan.	91.0	9.2	28.7	68.0	8.7	26.2
Feb.	7.6	3.9	5.2	6.9	4.0	4.7
March	42.0	3.2	14.1	27.0	3.0	10.0
April	47.0	6.0	16.7	40.0	4.8	15.6
May	30.2	3.1	7.4	25.1	2.9	6.7
June	8.1	2.8	4.8	6.7	2.5	4.3
July	13.9	2.3	5.7	10.7	2.0	4.7
Aug.	13.2	3.1	5.0	11.3	2.6	4.2
Sept.	36.3	3.4	7.7	29.0	2.9	6.2
Oct.	41.8	2.9	10.7	35.1	2.3	8.5
Nov.	48.2	4.5	16.9	44.2	3.9	14.8
Dec.	46.6	4.9	26.9	43.6	3.9	24.6

TABLE VIII

OWRC LAB. - WATER ANALYSIS

MONTH	HARDNESS AS $CaCO_3$ (PPM)	ALKALINITY AS $CaCO_3$ (PPM)	IRON AS Fe (PPM)	CHLORIDE AS Cl (PPM)	FLUORIDE AS F (PPM)	pH AT LAB	COLOUR IN HAZEN UNITS	PHENOLS IN (PPB)	TURBIDITY IN SILICA UNITS	SULPHATE AS SO_4 (PPM)
Jan. A	127	100	0.90	25		7.9	9	0	19.6	T
B	132	101	0.53	25		7.7	7	0	16.5	T
C	118	97	0.26	25		7.9	7	0	25.0	T
Feb. A	133	99	0.19	24		8.0	<5	0	2.7	16.0
B	135	101	0.19	24		7.8	<5	1	2.2	10.0
C	133	100	0.24	24		8.0	<5	0	2.7	11.0
Mar. A	138	104	0.48	24		8.0	10	1	4.2	14.8
B	138	103	0.59	23		8.0	13	7	7.5	38.5
C	138	101	0.12	25		8.0	<5	1	1.8	12.5
Apr. A	132	104	0.80	22		8.1	7	0	14.4	18.0
B	124	99	0.28	23		8.1	<5	0	4.2	15.5
C	137	104	0.70	19		8.0	8	0	19.1	13.3
May A	135	105	0.25	22		8.2	<5	3	3.8	26.8
B	141	100	0.22	23		8.1	<5	1	3.4	33.0
C	133	105	0.61	23		7.8	<5	8	11.7	26.0
June A	143	104	0.16	23		8.0	<5	3	3.1	28.0
B	140	102	0.13	23		8.1	<5	6	3.1	25.5
C	145	107	0.20	27		8.1	<5	0	3.4	32.5
July A	143	104	0.16	23		8.1	<5	1	3.0	28.4
B	142	95	0.22	24		7.9	<5	0	4.6	26.5
C	139	103	0.15	24		8.2	<5	5	1.5	25.3
Aug. A	134	106	0.41	24		8.2	<5	2	4.7	35.5
B	138	107	0.18	25		8.3	<5	4	2.6	31.5
C	144	110	0.13	27		8.2	<5	2	2.6	42.5
Sept. A	133	102	0.23	25		8.3	<5	0	2.1	29.5
B	140	101	0.13	25		8.3	<5	0	1.6	29.5
C	131	101	0.36	25		8.0	<5	0	3.0	25.5
Oct. A	136	99	0.21	26		8.0	5	0	3.0	29.0
B	138	100	0.18	27		8.1	<5	0	4.8	28.7
C	139	99	0.18	28		7.6	<5	0	2.2	26.5

TABLE VIII (Cont'd.)

MONTH	HARDNESS As $CaCO_3$ (PPM)	ALKALINITY As $CaCO_3$ (PPM)	IRON As Fe (PPM)	CHLORIDE as Cl (PPM)	FLUORIDE As F (PPM)	pH AT LAB	COLOUR IN HAZEN UNITS	PHENOLS IN (PPB)	TURBIDITY IN SILICA UNITS	SULPHATE As SO_4 (PPM)
Nov. A	139	102	0.74	29		7.8	5	0	6.5	28.0
B	140	102	0.25	30		7.9	<5	0	5.0	28.0
C	148	108	1.30	29		8.0	18	3	18.0	31.0
Dec. A	135	103	0.95	23	0.1	7.8	<5	0	23.4	25.0
D	135	99	0.66	23	0.1	8.1	<5	0	20.5	29.2

Note: A - Raw Water (OWRC Station)
B - End of OWRC Main (Dunnville P.U.C.)
C - End of OWRC Main (Pt. Maitland)
D - Treated Water (at Plant)

T - Trace
ppm - parts per million
ppb - parts per billion

(C) CHLORINATION

Chlorine is added to the microstrained water to render the water bacteriologically safe for human consumption. Daily tests for the chlorine residual in the water and weekly bacteriological tests were made and the results carefully studied. A total of 32,041 lbs. of chlorine was used during the year. A chlorine residual of 0.4 ppm was maintained in the water leaving the plant until August and then increased to 0.6 ppm for the remainder of the year in order to maintain a residual at the ends of the mains. A more detailed description is given in Table IX.

TABLE IX

MONTH	CHLORINE USED-LBS.	CHLORINE DOSAGE P.P.M.	CHLORINE RESIDUAL AT PLANT P.P.M.	CHLORINE DEMAND P.P.M.
Jan.	1663	0.77	0.40	0.37
Feb.	1366	0.70	0.40	0.30
March	1874	0.78	0.40	0.38
April	2082	0.87	0.40	0.47
May	2438	0.86	0.40	0.46
June	2633	0.95	0.40	0.55
July	1604	1.05	0.40	0.65
Aug.	2988	1.12	0.62	0.50
Sept.	4050	1.19	0.60	0.59
Oct.	4138	1.11	0.60	0.51
Nov.	3601	1.16	0.60	0.56
Dec.	3604	1.10	0.60	0.50
YEAR	32,041			

(D) POWER CONSUMPTION

During the year a total of 4,783,603 KWH was used at the plant at an average of 1.49 KWH per 1,000 gallons of water treated. The cost of power was $39,619.34 for the year and it averaged at 1.23¢ per 1,000 gallons. A more detailed description is given in Table X.

TABLE X

MONTH	KWH	KWH PER 1000 GAL. WATER	PEAK DEMAND KW	COST	POWER COST PER 1000 GAL. WATER
Jan.	333,348	1.57	692.3	$2,942.28	$0.0139
Feb.	290,457	1.49	649.8	2,961.65	0.0152
March	370,997	1.55	667.7	2,930.76	0.0122
April	371,028	1.55	695.3	3,037.41	0.0126
May	428,794	1.52	718.1	3,271.16	0.0116
June	416,172	1.50	720.4	3,274.06	0.0118
July	303,274	1.99	776.2	3,298.85	0.0216
Aug.	396,220	1.49	765.2	3,252.10	0.0122
Sept.	463,888	1.37	818.9	3,684.97	0.0109
Oct.	496,666	1.33	813.6	3,749.57	0.0101
Nov.	441,316	1.43	816.3	3,588.87	0.0116
Dec.	471,443	1.43	803.9	3,627.66	0.0110
Year	4,783,603	1.49	818.9	39,619.34	0.0123

(E) PLANT SUPERVISION

The staff at the treatment works are employed by the Ontario Water Resources Commission. At the end of the year 1962 the staff consisted of the following: Superintendent - R. Neff, R. Root, O. McLaughlin, A. Clark J. Cowan, A. Miller and R. Martineau. It had been found necessary at certain times of the year to engage part time casual labour. In October another full time operator was hired in order to eliminate the part time help and also to provide sufficient staff to cover the vacations and statuatory holidays bringing the staff to it's present number of seven.

General duties of the staff consisted of the operation and maintenance of the low lift station, treatment works, high lift station, and all equipment, meters, buildings and grounds, included in the system. They were also responsible for taking samples and carrying out various daily tests on the water. A 24 hour supervision was maintained throughout the year.

In addition to the supervision given by the local employees, the Division of Plant Operations of the OWRC through its engineers and technicians maintained periodic inspection services and analyses of treatment records, provided assistance with special technical or equipment problems and general supervision.

Approximately twenty visits were made by the project engineer during the year. The head office Maintenance Section made three visits to the plant, one of which consisted of a complete inspection of all buildings, mechanical and electrical equipment. The Electronics Section made approximately five visits to the plant which included both inspection and staff instruction of the controls. Approximately one hundred invoices were processed by the head office staff.

No part of the head office expense was charged to the project.

During the year Mr. Neff received his Water Works Operators' Certificate after successfully completing the course conducted by the OWRC for waterworks operators. Other members of the staff will be taking the course in the future.

Congratulations are extended to the entire plant staff for the high quality of operation which was maintained throughout the year.

V OPERATIONAL PROBLEMS

Certain problems were encountered during the year. Many of these were of a minor nature and were immediately corrected. Others of a more major nature were as follows:

During the month of January on several occasions an ice condition was experienced at the intake. The plant flow was reduced on these occasions until the intake had been cleared. The most successful method found of clearing the intake was to run the low lift pumps continuously at a reduced flow rate instead of the normal on and off operation.

Repairs were made to all six microstrainers during the year. The drum bearings which had been found to be faulty were repaired by the supplier. Also the strainer fabrics which had started to pinhole were repaired by soldering. The causes of pinholing in the fabrics is still under investigation.

The full automatic control of the high lift pumps on the Port Maitland Line was not complete and is under investigation. Also under investigation is the possibility of combining the Dunnville and Port Maitland Lines as a constant pressure sytem.

In July a leak was discovered in the Dunnville pipeline which was due to a faulty joint and repairs were made immediately.

VI COST DATA

(A) CAPITAL COST

The tentative total construction cost of this OWRC project 58-W-17 was $2,587,440.00 and was divided as follows:

Water Intake & Crib Structure	$151,080.00
Plant and Pumping	954,784.00
Town Mains	276,309.00
Mains to Serve Two Companies	686,490.00
River Crossing	260,000.00
Engineering Fees	142,250.00
Miscellaneous	45,846.00
	$2,516,759.00
Add. Capitalized Interest	70,681.00
	$2,587,440.00

The latest figure for the construction cost is $2,567,874.93.

(B) RESERVE FOR CONTINGENCIES

As of December 31, 1962 there was a total of $36,696.31 in the reserve fund. This fund is to be used in cases of major repairs or emergencies. The fund is invested by the Provincial Treasury and earned interest during 1962 at a rate of approximately 5 1/4%.

(C) OPERATING COSTS

The following is the operating budget for the year 1962 and the actual expenditures for 1962. A more detailed breakdown of the 1962 operating expenditures of $85,564.88 will be found on a following page in Table XI.

Item	Estimated 1962	Expenditure 1962
Payroll	28,740.	31,538.65
Fuel	1,500.	1,214.20
Power	37,200.	38,521.46
Chemical	2,400.	2,181.64
General Supplies	3,000.	2,888.93
Equipment	5,500.	3,982.80
Repairs & Maintenance	600.	1,056.03
Sundry	3,000.	4,181.17
Contingency (9.8%)	8,060.	
	$90,000.	$85,564.88

There was an increase in the payroll expenditure over the budgeted amount since overtime credits and accumulated statuatory holiday time since the plant started were paid for in 1962. It had been difficult to allow the operators time off but in October a new operator was hired and this should no longer be a problem.

It is difficult to separate equipment, repairs and maintenance. The expenditures for both items compare favourably with the combined forecast.

The sundry expenditure is larger than what was budgeted since a tax bill of approximately $1,300. was paid in 1962.

A total of 3,214,853,000 gallons supplied to the Town of Dunnville and to the Port Maitland Area during the year at a total operating cost of $85,564.88 which amounted to 2.66¢ per thousand gallons.

TABLE XI

EXPENDITURES 1962

MONTH	EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIP.	REPAIRS & MAINTENANCE	SUNDRY
Jan.	6495.27	2194.32	305.96	257.85	2729.70	52.05	29.23	926.08		
Feb.	6274.22	2019.40	202.64	261.05	2942.28	+44.18	432.36	224.66		236.01
March	8056.14	2134.96	259.14	206.99	2961.65	1810.00	247.75	295.08	27.07	113.50
April	5584.41	2036.20	192.52		2730.76		156.96			467.97
May	6916.15	2011.67	202.64	144.27	3037.41	64.02	352.20	224.98	525.09	353.87
June	6881.84	2052.70	202.64	108.38	3271.16	+1064.68	212.95	1420.86	448.90	228.94
July	7540.82	2062.95	315.23	96.60	3274.06		115.04			1676.94
Aug.	3667.41	3035.86	305.84			+81.78	125.43	99.11		182.95
Sept.	9824.19	2300.26	198.89		6550.95	+22.88	442.24		32.62	322.11
Oct.	8233.64	2242.16	197.64		3684.97	1360.00	215.82	323.92		209.13
Nov.	7296.09	2427.27	120.62	49.17	3749.57	109.09	223.30	416.47	22.35	178.25
Dec.	8794.70	4517.14		89.89	3588.87		335.65	51.65		211.50
Total	85,564.88	29,034.89	2,503.76	1214.20	38,521.46	2181.64	2888.93	3982.80	1056.03	4181.17

Note: + Credit